

Articles

Mental disorders and lack of social support among refugees and Ugandan nationals screening for HIV at health centers in Nakivale refugee settlement in southwestern Uganda

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Background

Exposure to potentially traumatic events and daily stressors in humanitarian settings puts refugees and asylum seekers (henceforth collectively referred to as refugees) at increased risk for mental disorders. Little is known about how mental disorder prevalence compares between refugees and national populations who live in the same settings and are exposed to many of the same daily challenges. We aimed to compare the proportions of refugees and Ugandan nationals screening positive for mental disorders in a Ugandan refugee settlement to inform targeted health interventions. Given displacement's disruptive effect on social networks and the importance of social support for mental health, we also aimed to assess social support.

Methods

Refugees and Ugandan nationals voluntarily testing for HIV at health centers in Nakivale Refugee Settlement were screened for post-traumatic stress disorder (PTSD Checklist-6 – Civilian Version [PCL-6]), depression (Patient Health Questionnaire-9 [PHQ-9]), anxiety (General Anxiety Disorder-7 [GAD-7]), and lack of social support (Brief Social Support Scale [BS6]). The association between refugee versus Ugandan national status and the four outcomes was assessed using log-binomial regression.

Results

Screening surveys were completed by 5,513 participants, including 3,622 refugees and 1,891 Ugandan nationals. A positive screen for PTSD, depression, anxiety and lack of social support was found for 2,388 (44%), 1,337 (25%), 1,241 (23%) and 631 (12%) participants, respectively. Refugee status was associated with a higher prevalence of a positive screen for PTSD (prevalence ratio (PR)=1.15; 95% confidence interval (CI)=1.08-1.23), depression (PR=1.22; 95% CI=1.11-1.36), anxiety (PR=1.28; 95% CI=1.14-1.42), and lack of social support (PR=1.50; 95% CI=1.27-1.78). When adjusted for the other outcomes, the higher prevalence of a positive screen for PTSD, anxiety and lack of social support for refugees remained statistically significant.

Conclusions

Elevated symptoms of mental disorders are found among refugees and Ugandan nationals testing for HIV in Nakivale Refugee Settlement. The significant association between refugee status and PTSD, anxiety and lack of social support symptoms highlights the distinct needs of this population. To determine the prevalence of mental disorders in these populations, comprehensive assessment, including psychological and neuropsychological testing, is needed.

Worldwide over 26 million refugees and 4.1 million asylum seekers have been displaced, fleeing violence, conflict or persecution.¹ Due to ongoing conflict and limited repatriation and resettlement opportunities, many live in a protracted state of displacement.² Exposure to potentially traumatic events in their countries of origin or during their flight, including the loss of family members, torture, rape, injury, threat to life, and witnessing of extreme violence, contribute to high rates of mental disorders among refugees.^{3–5} Stressors associated with challenges of daily living in a post-emergency humanitarian setting, such as lack of access to basic needs like food and water, high housing density, eroded social support structures, limited livelihood opportunities, and a high degree of uncertainty and insecurity, have further detrimental impacts on mental health and resilience.^{6–11} A higher prevalence of mental disorders has been reported among refugee populations compared to the general population in host countries.^{9,12,13} These data, however, are based mainly on research from high-income Western countries and reported prevalence rates range significantly between studies which may be attributable to differences in sampling approach, measurement tools, assessment timing, and heterogeneity in refugee origin and setting.^{13–15}

Uganda is the fourth largest refugee-hosting country in the world and hosts over 1.5 million refugees, 95% of whom live in refugee settlements.^{16,17} While there are indications that the mental health status of refugees is worse than that of the Ugandan population, it is unknown how the prevalence of mental disorders among refugees compares with that among the Ugandan population accessing health services in refugee settlements in Uganda.¹⁸ The Ugandan population has witnessed gross human rights violations and extreme conflict in the decades following Uganda's independence. During the Ugandan Bush War from 1981–1986, and in the over twenty years of civil war between the Ugandan government and Joseph Kony's Lord's Resistance Army, Ugandan civilians suffered atrocities including abduction, forced combat, rape, torture, and murder.^{19–22} Challenging economic circumstances are also a reality for many Ugandans. According to the latest World Bank estimates, 21.4% of Ugandans, and even higher in rural areas, live below the national poverty line.²³ The association between low socio-economic status and mental health has been well-described and poverty is thought to be both a social determinant as well as a consequence of psychiatric morbidity.^{24–29}

As part of an HIV linkage study in southwestern Uganda, mental health screening data was gathered on over 5,500 adults participating in routine HIV testing at health centers in Nakivale Refugee Settlement. Our objective was to assess the prevalence of symptoms of mental disorders and lack of social support in this humanitarian setting and compare the association of refugee status (including asylum seeker status) versus Ugandan national status and the risk of screening positive.

METHODS

STUDY SETTING

Nakivale Refugee Settlement was established in 1958 to provide shelter to the Tutsi refugees fleeing the Rwandan Revolution.³⁰ It is located approximately 50 km from Mbarara in southwestern Uganda near the Tanzanian border and spans over 185km².³⁰ Currently, the settlement hosts 135,998 (10%) of the 1.5 million refugees in Uganda and 1,202 (4%) of the 28,368 asylum seekers in the country.³¹ The majority of refugees in Nakivale are from the Democratic Republic of the Congo (DRC) (69,529; 46%), followed by Burundi (39,467; 29%), Somalia (13,876; 10%), Rwanda (10,136; 7%), Eritrea (1,792; 1%), and Ethiopia (913; 1%).³¹ Alongside the refugees, either within or close to the settlement boundaries, live roughly 35,000 Ugandan nationals who are considered illegal settlers by the Ugandan government and are often attracted to the settlement by the infrastructure and resources that accompany humanitarian programs.^{30,32} Refugees who settle in Nakivale are given a 50 x 100 meter plot of land for subsistence farming and food rations that are phased out over time.³³ Unreliable climatic conditions, high food prices and limited food distribution contribute to food and water insecurity in the region and 8.8% of households in Nakivale score 'poor' or 'borderline' on the Food Consumption Score.^{34–37} Formal employment is scarce, and the main livelihood activities are subsistence farming, animal husbandry, small-scale entrepreneurship, and trading of goods. Nakivale Refugee Settlement is administered by the Ugandan Office of the Prime Minister (OPM) in collaboration with UNHCR. Together, OPM and UNHCR coordinate and monitor the work of operating and implementing partners providing health, nutrition, protection and education services in the settlement.³⁰ Nakivale houses four health centers at which health services are provided to both refugees and Ugandan nationals by the non-governmental organization Medical Teams International. Health services are provided free of charge and include HIV testing and care, including antiretroviral therapy when indicated. During the study period, mental health services were provided in the settlement by Tutozona, a faith-based organization that has been active in the settlement since 2013.³⁸

STUDY DESIGN

Here we report the findings of a mental disorder screening and an assessment of social support conducted as part of an HIV linkage study in Nakivale Refugee Settlement. Enrollment occurred from March 2018 to March 2020. We describe the details of the linkage study as they relate to the current research.

HIV LINKAGE STUDY

Adults waiting at the Outpatient Department of three health centers in Nakivale Refugee Settlement were offered group information sessions about HIV twice daily while waiting for their medical evaluation. Information sessions

were led by multi-lingual research assistants recruited from the refugee community and trained. At the end of each HIV information session, free HIV testing was offered. Individuals not previously diagnosed with HIV who were interested in HIV testing were brought to a private area and underwent a verbal intake survey after providing written informed consent. Participant characteristics that were thought to influence HIV care linkage were assessed based on prior qualitative work in this setting.³⁹ Information was collected on demographics (sex, age, refugee status, nationality, marital status, dependents, education), time spent in and away from Nakivale (residence in the settlement, residence duration, residence intent, travel), and HIV-related stigma and HIV disclosure intent in the event of a positive diagnosis. As part of the intake survey, social support was also assessed, and participants were screened for mental disorders (detailed description to follow). Questions were read to participants in Swahili, Kinyarwanda, Runyankore or English, depending on their preference. The research assistant entered responses directly into an electronic mobile REDCap database. Following the intake survey, participants underwent HIV testing and were provided with their results. Participants testing positive were offered post-test counseling services and were escorted to the clinic if willing. Those not willing to be evaluated at the HIV clinic that day were given an appointment date to meet with the HIV clinician and were encouraged to return to HIV clinic to receive free care.

MENTAL HEALTH AND SOCIAL SUPPORT ASSESSMENTS

In the intake survey, participants voluntarily testing for HIV were screened for three mental disorders: post-traumatic stress disorder (PTSD), depression, and anxiety. PTSD was assessed using the abbreviated PTSD Checklist – Civilian Version (PCL-C) consisting of 6 items (PCL-6).⁴⁰ Participants were asked about the extent to which their life is affected by PTSD symptoms, with answer options ranging from not at all (1) to extremely (5). In the present sample, the PCL-6 showed excellent internal consistency (Cronbach's alpha=0.92); a total score ≥ 14 indicated screening positive for PTSD.

The depression module of the Patient Health Questionnaire (PHQ-9)⁴¹ was used to screen participants for depression. Using the PHQ-9, the extent to which 9 DSM-IV criteria for depression were present was scored from 'not at all' (0) to 'nearly every day' (3). Based on their total score, participants can be classified as having minimal or no depression (0-4), mild depression (5-9), moderate depression (10-14), moderately severe depression (15-19), or severe depression (20-27). In the present sample, the PHQ-9 showed good internal consistency (Cronbach's alpha=0.85); a score of ≥ 10 was considered a positive screen for depression.^{42,43} The PHQ-9 was recently validated in a different refugee settlement in Uganda for use among Congolese refugees.⁴⁴

Participants were screened for anxiety using the General Anxiety Disorder 7 (GAD-7),⁴⁵ a 7-item general anxiety disorder scale scoring the presence of anxiety symptoms from not at all (0) to nearly every day (3). Depending on the to-

tal score, either minimal anxiety (0-4), mild anxiety (5-9), moderate anxiety (10-14), or severe anxiety (15-21) is present. In the present sample, the GAD-7 showed good internal consistency (Cronbach's alpha=0.88); a score of ≥ 10 was considered a positive screen for anxiety in the current study.⁴⁶

Social support available to participants was assessed using the Brief Social Support Scale (BS6),⁴⁷ a six-item bifactorial instrument assessing both emotional dimensions (e.g., how often is someone available to give you good advice about a crisis / to confide in or talk to about yourself or your problems?) and tangible dimensions (e.g., how often is someone available to take you to the doctor / to prepare your meals if you are unable to do it yourself?) of social support. For each question, the availability of support is scored from never (1) to always (4). Social support is discerned based on the score total, and is classified as either low (6-11), moderate (12-17), high (18-23), or very high (24). In the present sample, the BS6 showed excellent internal consistency (Cronbach's alpha=0.93); a score ≤ 11 was considered indicative of a *lack* of social support.

DATA ANALYSIS

Data were stratified based on participants' Ugandan national or refugee status. Simple frequencies were used to describe the characteristics of the two groups. Crude and adjusted prevalence ratios (PRs and aPRs) were estimated using log-binomial regression to estimate the association between refugee status (vs Ugandan national status) and the four outcome variables of interest: PTSD, depression, anxiety, and lack of social support. The adjusted regression models included the other outcome variables as covariates to assess for potential confounding (e.g., in the adjusted regression model specifying PTSD as the outcome, we included depression, anxiety, and lack of social support as additional covariates). To explore differences between refugees from different countries of origin, we re-fitted the unadjusted and adjusted regression models for prominent refugee country groups separately, comparing refugees from Burundi, Rwanda and the DRC (respectively) to Ugandan nationals. Because the adjusted log-binomial regression model for PTSD among Rwandan refugees failed to converge, we used Poisson regression with robust errors to estimate crude and adjusted prevalence ratios.^{48,49} All analyses were performed using Stata version 16 software (StataCorp, College Station, TX).

ETHICS AND CONSENT

Ethical approval was granted by the Makerere University School of Health Sciences Research and Ethics Committee (SHSREC REF No. 2012-020), the University of Washington Human Subjects Division (STUDY00007766), and the Mass General Brigham Institutional Review Board (2012P000839). The Ugandan National Council of Science and Technology (HS 1167) granted clearance to conduct this research and approval was also granted by the Ugandan Office of the Prime Minister (OPM). All study participants provided written informed consent before participation in

this study. Care was taken to protect the confidentiality of the data collected, and all data was stored in a locked location or on password-protected electronic devices kept in a locked location. While mental health screening scores were not computed in real-time, research staff were trained to recognize distress among study participants and refer individuals to clinical care when further evaluation and possible treatment were needed. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Box 1. Paper context.

Research comparing the prevalence of mental disorders among refugees and host populations has mainly been conducted in high-income countries and drawing conclusions is limited by study heterogeneity. There is a paucity of data on how the prevalence of mental disorders differs between refugees in refugee settlements in Uganda and Ugandan nationals accessing care in the same setting. We provide mental disorder screening data for a large sample of refugees and Ugandan nationals in this humanitarian context.

RESULTS

A total of 5,513 participants consented to voluntary HIV testing at health centers in Nakivale Refugee Settlement during the study period and were screened for mental disorders and lack of social support. Most participants were female (54%), with a mean participant age of 32.2 years (standard deviation 11.3) (Table 1). Of these participants, 3,622 (66%) were refugees (or asylum seekers) and 1,891 (34%) were Ugandan nationals. Refugee participants mainly came from the DRC (36%), Rwanda (33%), and Burundi (26%). Almost all refugee participants (96%) reported living in Nakivale Refugee Settlement and nearly half of Ugandan nationals (47%), with 57% of refugees and 62% of Ugandan nationals living in the settlement for more than five years. The majority of participants were in (self-reported) good to excellent health (67%) and were not limited by their health in daily activities (78%).

Of the participants voluntarily testing for HIV in Nakivale Refugee Settlement, 2,388 (44%) screened positive for PTSD, 1,337 (25%) screened positive for depression, 1,241 (23%) screened positive for anxiety, and 631 (12%) screened positive for lack social support. Refugee status was associated with higher prevalence of elevated symptoms of each of the three mental disorders (Table 2). Compared with Ugandan nationals, refugees had a higher prevalence of a positive screen for PTSD (prevalence ratio (PR)=1.15; 95% confidence interval (CI)=1.08-1.23), depression (PR=1.23;

95% CI=1.11-1.36), and anxiety (PR=1.28; 95% CI=1.14-1.42), as well a higher prevalence of lack of social support (PR=1.50; 95% CI=1.27-1.78). When adjusted for the other outcome variables of interest (i.e. PTSD, depression, anxiety, lack of social support) in multivariable regression analysis, the higher prevalence of a positive screen for PTSD, anxiety and lack of social support for refugees and asylum seekers remained statistically significant, whereas the higher prevalence of elevated symptoms for depression was no longer statistically significant (Table 2).

When comparing prominent refugee country groups (i.e., Burundi, Rwanda, DRC) to Ugandan nationals, Burundian and Rwandese refugees were found to have a significantly higher prevalence of a positive screen for PTSD (Burundi adjusted (a)PR=1.09; 95% CI=1.02-1.16, Rwanda aPR=1.17; 95% CI=1.09-1.27), and only Burundian refugees had a significantly higher prevalence of elevated symptoms of anxiety (aPR=1.14; 95% CI=1.03-1.25). For all three country groups, a significantly higher prevalence of lack of social support was found compared to Ugandan nationals (Burundi aPR=1.79; 95% CI=1.45-2.21, Rwanda aPR=1.50; 95% CI=1.22-1.84, DRC aPR=1.29; 95% CI=1.04-1.60). None of the refugee country groups had a significantly higher prevalence of a positive screen for depression in the adjusted regression model.

DISCUSSION

In this study of 5,513 participants seeking care at health centers in Nakivale Refugee Settlement in southwestern Uganda, a higher prevalence of a positive screen for PTSD, depression, anxiety and lack of social support was found among refugees and asylum seekers compared to Ugandan nationals. In multivariable analysis, when adjusting for the other three outcomes of interest, refugee/asylum seeker status remained significantly associated with a higher prevalence of elevated symptoms of PTSD, anxiety and lack of social support, whereas the higher prevalence of depression symptoms for refugees was no longer statistically significant.

This mental health screening of adults voluntarily testing for HIV at health centers in Nakivale Refugee Settlement suggests that symptoms of mental disorders are common in this setting. These findings align with previous studies conducted among Congolese, Rwandan, Somali and Sudanese refugees living in Ugandan refugee settlements, which have reported PTSD prevalence rates ranging from 32-67%.⁵⁰⁻⁵⁵ A study conducted in 2003 in Nakivale Refugee Settlement, in which the Post-traumatic Diagnostic Scale (PDS) and the Hopkins Symptom Checklist 25 were used to screen 1,422 Rwandese and Somali refugees for PTSD and depression, respectively, high depression and anxiety symptom scores and a PTSD prevalence of 32% were found for Rwandan refugees and 48.1% for Somali refugees⁵³ which prompted the initiation of a mental health intervention program.⁵⁶ Findings from a later study in 2013 among 426 Congolese refugees in Nakivale in which the PDS was also used to screen for PTSD⁵⁴ as well as the results from the current study suggest that the mental

Table 1. Comparison of refugee/asylum seeker and Ugandan national participants

	Refugees/Asylum Seekers N=3,622 (%)	Ugandan Nationals N=1,891 (%)	P-value
Age, mean (SD)	31.7 (11)	33.1 (11)	<0.001
Sex			<0.001
Female	1896 (52)	1103 (58)	
Male	1723 (48)	787 (42)	
Site Name			<0.001
Nakivale Health Center	2104 (58)	661 (35)	
Juru Health Center	931 (26)	460 (24)	
Kibengo Health Center	586 (16)	770 (41)	
Country of Origin			<0.001
Democratic Republic of the Congo	1305 (36)	N/A	
Rwanda	1183 (33)	N/A	
Burundi	934 (26)	N/A	
Uganda	146 (4)	N/A	
Other*	54 (1)	N/A	
Live in Nakivale			<0.001
Yes	3479 (96)	890 (47)	
No	140 (4)	1000 (53)	
Years living in Nakivale			<0.001
<1 year	379 (11)	147 (17)	
1-5 years	1117 (32)	190 (22)	
5+ years	1954 (57)	547 (62)	
Relationship Status			<0.001
Married/Living Together	1756 (49)	1274 (67)	
Divorced/Separated/Widowed	906 (25)	391 (21)	
Single	949 (26)	226 (12)	
Education			<0.001
No school	863 (24)	317 (17)	
Some primary	1751 (48)	1044 (55)	
Completed primary	223 (6)	231 (12)	
More than primary	783 (22)	297 (16)	
Prior HIV Testing			<0.001
Never Tested	421 (12)	143 (8)	
Previously Tested	3182 (88)	1739 (92)	
Minutes to HIV clinic, mean (SD)	46 (44)	92 (82)	<0.001
Years planning to remain in Nakivale			<0.001
Less than or equal to 5 years	109 (3)	71 (8)	
> 5 years	84 (2)	44 (5)	
No plan to leave	566 (16)	430 (48)	
No answer	2716 (78)	342 (39)	
Travel away from Nakivale (≥1 month in last year)			0.003
Yes	919 (27)	280 (32)	
No	2535 (73)	605 (68)	
Reason for being away?			0.015
Employment	485 (53)	140 (50)	
Trade	139 (15)	43 (15)	
Family	218 (24)	82 (29)	
School	30 (3)	4 (1)	
Health	26 (3)	6 (2)	
Other†	20 (2)	5 (2)	

SD = standard deviation

*Other included: Kenya, Somalia, Sudan, South Sudan, Ethiopia

† Other included: political, military, jail, holiday, other

health of refugees residing in Nakivale Refugee Settlement has not improved significantly in the past 18 years. Country-level prevalence data from the Global Burden of Disease (GBD) study show that the prevalence of mental disorders in refugee countries of origin, including the Democratic Republic of the Congo, Rwanda, Burundi, and Somalia is gen-

erally lower than in Uganda, with prevalence rates of depression ranging from 4.49 – 5.50% in countries of origin versus 6.69% in Uganda, and the prevalence of anxiety disorders ranging from 3.33 – 3.85 % in countries of origin versus 4.15% in Uganda.⁵⁷ The GBD data suggest that the higher mental health symptom burden found among

Table 2. Comparing refugees/asylum seekers vs Ugandan nationals assessing mental health and social support screening outcomes

PTSD	Negative (n=3070)	Positive (n=2388)	Prevalence Ratio (PR) (95% CI)	Adjusted Prevalence Ratio (aPR) (95% CI)*
Ugandan Nationals	1130 (60.3)	745 (39.7)	1.0 (ref)	1.0 (ref)
Refugee/Asylum Seekers	1940 (54.1)	1643 (45.9)	1.15 (1.08-1.23)	1.09 (1.04-1.15)
Depression	Negative (n=4024)	Positive (n=1337)	PR (95% CI)	aPR (95% CI)*
Ugandan Nationals	1439 (78.3)	399 (21.7)	1.0 (ref)	1.0 (ref)
Refugee/Asylum Seekers	2585 (73.4)	938 (26.6)	1.23 (1.11-1.36)	1.04 (0.97-1.12)
Anxiety	Negative (n=4134)	Positive (n=1241)	PR (95% CI)	aPR (95% CI)*
Ugandan Nationals	1479 (80.5)	359 (19.5)	1.0 (ref)	1.0 (ref)
Refugee/Asylum Seekers	2655 (75.1)	882 (24.9)	1.28 (1.14-1.42)	1.09 (1.01-1.18)
Lack of Social Support	Negative (n=4755)	Positive (n=631)	PR (95% CI)	aPR(95% CI)*
Ugandan Nationals	1676 (91.2)	162 (8.8)	1.0 (ref)	1.0 (ref)
Refugee/Asylum Seekers	3079 (86.8)	469 (13.2)	1.50 (1.27-1.78)	1.46 (1.23-1.73)

CI = Confidence interval

*Adjusted for all other variables listed in the table

refugees in this study compared to Ugandan nationals cannot be explained by a higher prevalence of these disorders in their countries of origin. While a direct comparison of the mental health of the general population in the countries of origin and of the refugee population included in this study is not possible as our findings concern screening data and not data on mental disorder diagnosis, the 6-fold degree of difference suggests that the refugee population is distinct. Experiences unique to refugees may exacerbate existing mental disorders or contribute to the manifestation of mental health symptoms. The elevated mental health symptoms found among the refugee population in this study may be related to (conflict-related) traumatic exposures in their countries or origin or during their flight and continued exposure to daily contextual stressors including poverty, poor nutrition, and few employment prospects in the refugee settlement.⁵³

While higher prevalence rates of PTSD, depression and anxiety symptoms were found among refugees compared to Ugandan nationals in the current study, the prevalence rates among nationals voluntarily testing for HIV in this sample are also considerable, with one in five participants screening positive for anxiety and depression and two in five screening positive for PTSD. Rates found for Ugandan nationals surpass WHO national-level estimates of depressive disorders and anxiety disorders in Uganda, 4.6% and 2.8% respectively,⁵⁸ but fall within the range reported by Ovuga et al. who found probable moderate to severe depression rates of 6% and 26.3% among the general population in the Ugandan districts Bugiri and Adjumani respectively using the 13-item Beck Depression Inventory (BDI).⁵⁹ The higher rate seen in Adjumani was thought to be attributable to greater psychosocial stressors associated with lower quality of life, poorer living conditions, and less social cohesion in this rural district that has suf-

fered directly from the impact of long-term armed insurgency. The percentage of nationals screening positive for PTSD in Nakivale emulates percentages found in Northern Uganda among internally displaced persons who suffered multiple traumatic events, survivors of sexual violence, and formerly abducted youth who were directly impacted by the 20-year conflict between the Ugandan government and the Lord's Resistance Army.⁶⁰⁻⁶² For those who experienced such adversities during childhood, elevated rates of mental health problems could persist well into adolescence and adulthood.⁶³⁻⁶⁵ It is also possible that the characteristics or the circumstances that cause some Ugandan nationals to leave Ugandan society voluntarily or involuntarily and settle in Nakivale Refugee Settlement put them at greater risk for mental disorders.

Although it goes beyond the scope of this study to establish causality and determine the degree to which different aspects of refugee (settlement) existence contribute to mental disorders, the findings from Nakivale make it clear that there is a significant burden of poor mental health among both refugees and Ugandan nationals. The persistence of mental disorder symptoms many years after participants arrive in the settlement suggests that daily life circumstances in refugee settlements (e.g., poor socio-economic conditions) likely maintain and contribute to mental disorders. Further research is needed to gain insight into the mental health problems of this distinct population and how best to address them.

While most participants in our study in Nakivale Refugee Settlement had social support available, one in eight refugees and one in eleven Ugandan nationals reported a lack of social support. The higher prevalence among refugees is expected as war and displacement are known to disrupt the social fabric of communities and can lead to the breakdown of social norms and ties.⁶⁶⁻⁶⁹ The fact that

over half of refugee participants have lived in Nakivale for over five years, a time in which new social networks could have been built, may contribute to a high percentage (87%) of participants experiencing social support. The beneficial impact of social support on wellbeing has been well established. Social support is known to mitigate life stressors⁷⁰ that are endemic to resource-limited settings like Nakivale (e.g., food insecurity)^{56,71} and has been reported in qualitative interviews to facilitate healthcare access, treatment adherence, HIV diagnosis acceptance and HIV stigma mitigation in Nakivale Refugee Settlement.^{39,72,73} Social support also plays a crucial role in preserving mental health.⁷⁴ Some studies have identified direct effects of social support⁷⁵; in a study among urban refugee and displaced youth in Kampala Uganda, higher perceived social support was associated with reduced rates of depression, and social support mediated the association between food insecurity and depression.⁷⁶ Other studies have found that social support may play a buffering role against stressors.^{63–65} In our study, the increased prevalence of depression symptoms for refugees and asylum seekers was no longer statistically significant when adjusted for PTSD, anxiety and social support. Social support may also be the mediating factor between refugee status and depression in this setting.

When evaluating the prominent refugee country groups separately, a significantly higher aPR of PTSD was only found for refugees from Rwanda and Burundi. A significantly higher aPR of anxiety was only found for refugees from Burundi. These findings highlight that these groups represent distinct subpopulations with unique characteristics. Differences in past experiences and motivation behind seeking asylum may explain the differences found among these refugee country groups. The finding that there is a significantly higher aPR of a lack of social support across all refugee country groups emphasizes the disruptive influence of displacement.

The findings of this study should be considered in the context of the study's limitations and strengths. The uniform assessment of refugees and members of the host community with the same methodology within the same setting allows for direct comparison between the two groups and, along with the high sample size of over 5,000 participants, can be considered the strength of this study. The study, however, also has limitations. First, participants in this study were recruited from health center waiting areas which may have resulted in selection bias. It is plausible that people visiting the health center for medical reasons were in worse health than the general population in the settlement, which may have directly or indirectly influenced their mental health status. Participants interested in testing to find out their HIV status may be worried about their HIV status and may be more likely to be living with HIV, which has been associated with higher rates of mental disorders than the general population.^{77,78} Second, an enrollment criterion for this study was the willingness to participate in HIV testing. Sub-populations with high anticipated HIV stigma may be underrepresented in the study sample as they may have declined HIV testing and participation. This could explain the low representation of So-

mali refugees for whom HIV is still highly stigmatized – the study population included 1.5% Somali refugees though Somalis make up 10% of the population in Nakivale Refugee Settlement. These factors may limit the generalizability of results to the entire refugee population in Uganda. While additional analyses were performed to explore the differences between refugees by country of origin, other delineating characteristics (e.g., ethnic groups) may be more influential and were not considered. Finally, while the screening tools used in this study were suitable for rapidly assessing and identifying individuals with the highest likelihood of the disorders of interest, they remain self-report instruments that are inherently not diagnostic and may over or underestimate the true prevalence of these disorders.⁷⁹ They have also not been validated specifically for this population.

CONCLUSIONS

Refugee/asylum seeker status is associated with an increased prevalence of symptoms of mental disorders and less social support in Nakivale Refugee Settlement. Prevalence rates of a positive screen for PTSD, depression, anxiety and limited social support are high in both the refugee population and among Ugandan nationals living in this setting. The mental ill-health burden in Nakivale underscores the need to prioritize strengthening mental health services and psychosocial support mechanisms within primary care facilities or community settings. Strengthening social support structures may be an effective addition to existing programs addressing mental health problems for refugees and host community members seeking care in refugee settlements.

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AUTHORSHIP CONTRIBUTIONS

KNO led the research design supported by contributions from ACT, IVB, AK, and SA. Data collection was coordinated by ZF. JS performed the statistical analysis of study data. REK prepared the manuscript together with KNO. ACT, AK, IVB, JS, PV and SA provided feedback and edits. All authors read and approved the final manuscript.

COMPETING INTERESTS

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